Floodplain Management Activities and Options
In the Santa Clara Valley

Consultant's Report

April 24, 1995

Prepared for

The Santa Clara Valley Water District

San Jose, California

By

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Introduction

Background. The Santa Clara Valley Water District has been in the business of flood control since its predecessor agency was created in 1951. Its statutory authority lists several objectives:

> "The objects and purposes of this act are to provide for the control of the flood and storm waters of the district ... and to protect from such flood or storm waters the public highways, life and property in the district..." (Stats. 1951, c. 1405, p. 3337, as amended, § 4.)

The District has traditionally focused most of its efforts and resources on the first objective, to control flood and storm waters. It has invested millions of dollars in channel improvements, levees, and other capital improvements to control the flow of water. While these projects are proven to stop flooding they have several shortcomings:

- They are expensive and take many years to design, fund and build,
- They are built to a design flood standard and can be overtopped by larger floods or when upstream development increases the runoff and overloads the facility,
- They are not appropriate or cost effective for all flood problems, and
- They require continual maintenance.

As recognized by the act that created the District, there are other ways "to protect from such flood or storm waters the public highways, life and property." These are often called nonstructural approaches to prevent or reduce flood losses. These have included regulating encroachments on District channels, public information materials, and encouraging sound drainage practices in new developments.

Following the flooding in January 1995, District staff questioned whether it was doing all it could to prevent and reduce flood damage. Are there additional things that the District could be doing short of building more structural projects? Are there things the District could be doing to support city and county flood loss reduction activities? French & Associates, Ltd., was contracted to address these two questions.

Purpose. This report is French & Associates' preliminary findings on the possible activities and options the District could pursue. It identifies issues and current or potential activities and lists recommendations. The issues and recommendations are grouped in seven sections:

1. Floodplain Management
2. Mapping
3. Project Planning
4. Corrective Measures
5. Preventive Measures
6. Regulations
7. Communication and Coordination

French Wetmore was the principal investigator and author of this report. His findings and recommendations are based on a review of District materials and interviews with District, state and federal staff and representatives of the cities of Milpitas, Morgan Hill, and San Jose. The people interviewed are listed in Appendix A.

1. Floodplain Management

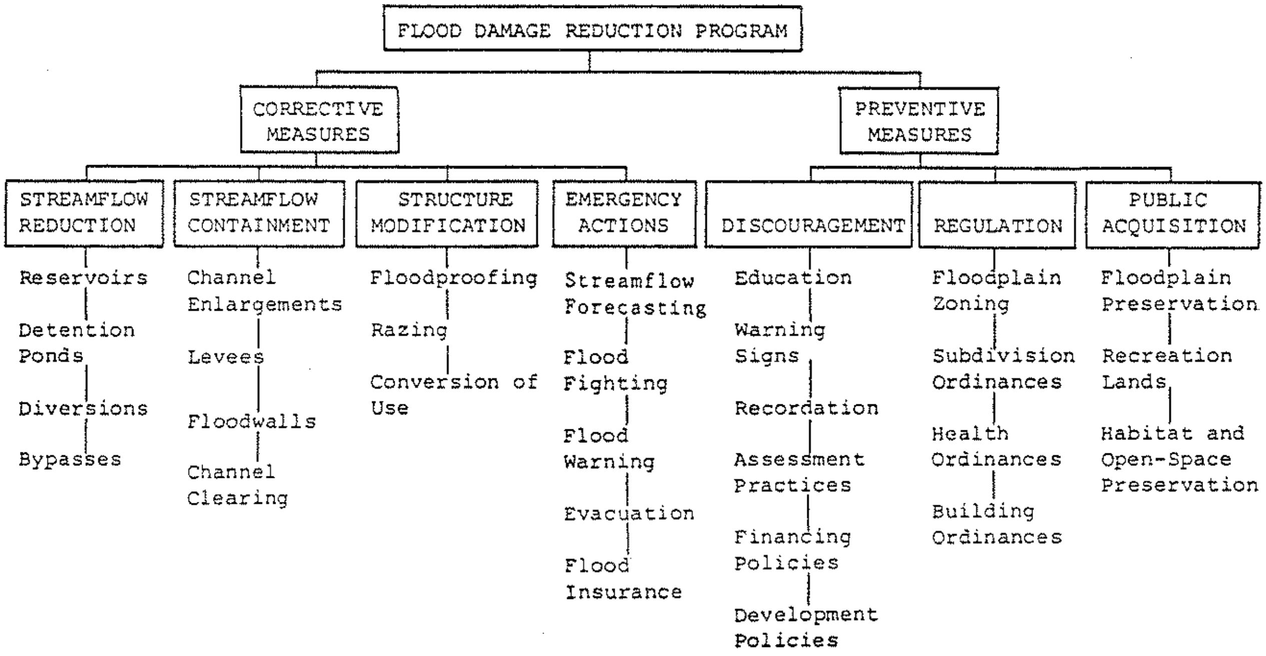
In order to identify what the District could do, there needs to be a list of the universe of floodplain management activities. There also needs to be an assurance that the District is able to implement those activities. These concerns are addressed in this section.

1.1. Floodplain management activities. A floodplain management program typically has two parts: identifying and mapping the flood hazard and undertaking activities to either reduce the hazard or reduce the impact of the hazard on development in the floodplain. The types and extent of activities depend on the hazard, funds available and agency authorities and interests.

There are different lists of what activities should be considered for implementation to reduce flood damage. For example, the Unified National Program for Floodplain Management lists three categories of activities: those that modify susceptibility to flood damage and disruption (regulations, floodproofing, warning systems, etc.), those that modify flooding (structural flood control projects), and those that modify the impact of flooding on individuals and the community (insurance, recovery, etc.).

The District uses a different set of categories but has a similar list of activities as shown in Figure 1. This list is as comprehensive as the others that are commonly used.

Figure 1. Floodplain Management Activities



Source: SCVWD Handbook for Flood Control Zone Advisory Committees, page IV-5.

Recommendation: The District should consider all of the activities listed in Figure 1 as part of a comprehensive floodplain management program. This report will review the District's program using the categories and activities in Figure 1.

1.2. Statutory Authority. In order to implement these activities, the District must have the legal authority. As noted in the introduction, the District's authority is broad. Section 5 of the act enumerates the District's powers. Subsection 5.6 relates to flooding:

> 6. To control the flood and storm waters of said district...and to conserve such waters for beneficial and useful purposes...and protect from damage from such flood or storm waters the watercourses, watersheds, public highways, life and property in said district...."

The fact that the third item is listed in addition to the authority to control flood and storm waters indicates that the District is given direction to implement both structural and nonstructural floodplain management activities. Further, Section 34 states that "This act, and every part thereof, shall be liberally construed to promote the objects thereof, and to carry out its intents and purposes."

Recommendation: The District should consider itself as having the statutory authority and direction to implement a broad range of structural and nonstructural activities. Specific powers, especially regulatory ones, would need to be researched by legal counsel.

1.3. Community Rating System. The Community Rating System (CRS) is a rating tool used by the National Flood Insurance Program (NFIP). Flood insurance rates are reduced in those communities that initiate floodplain management activities above and beyond the minimum regulatory requirements of the NFIP. The CRS has been shown to encourage communities to initiate new activities and to maintain the ones they already implement. It is also a helpful yardstick to measure the extent of local floodplain management programs. A copy of *Summary of the Community Rating System* has been provided.

In 1990 four Santa Clara County communities applied to the CRS: Los Altos, Milpitas, Palo Alto and San Jose. Since then Milpitas and Palo Alto submitted modifications to improve their rating. No other communities have applied. Lacking the specific land use regulatory authority, the District cannot participate in the NFIP or the CRS directly. However, it can support the cities' activities. In fact, the cities currently receive CRS credit for some of the District's programs that are implemented in their corporate limits.

Recommendation: The District should encourage community participation in the CRS and should provide technical and other support to help the cities and the County obtain the best classification possible. The balance of this report identifies where District activities can support CRS credit by identifying the relevant CRS activity number. These activities are summarized in Appendix B.

2. Mapping

The first step in floodplain management is to identify the flood hazard and map the areas it affects. Mapping can be an expensive process. It can also be complicated when different agencies produce their own maps to different mapping criteria. The job is made harder when flood conditions change over time and older maps become obsolete which weakens the programs that are based on those maps.

2.1. Flood insurance mapping. The NFIP has provided a single mapping standard for overbank flooding in areas that drain more than one square mile (640 acres) in urban areas. The NFIP also has a system for updating its maps when conditions change, especially when new development fills in a flood hazard area. A new Flood Insurance Rate Map (FIRM) is nearing completion for the county. Unlike previous versions, it will be a county-wide map, i.e., all the cities and unincorporated areas of the county will be shown on the same map, preventing "waterfalls" at city limits.

Recommendations:

a. The District should closely review the draft FIRM to be sure that it includes recent letters of map amendment, letters of map revision, and District projects.

b. The District should volunteer to be the central point of contact for the map review process. If there are problems, they will be better handled and responded to if done through a single, coordinated voice on behalf of all the communities in the County by people knowledgeable in mapping and the map review process. The District has the expertise and resources to provide this service.

c. The District should review the draft FIRM to be sure it includes studies that have been prepared by the District, the cities, developers, and other organizations other than the Federal Emergency Management Agency (FEMA). This includes floodplains smaller than the FEMA mapping standard of 640 acres. The results can be used to provide CRS credit under Activity 410 in the communities affected.

2.2. Floodway mapping. Certain floodplain regulations are successful only if the floodway portion of the floodplain has been mapped. Currently, only about half of the County's streams have NFIP floodway maps. The City of San Jose developed what appears to be a reasonable approach to regulate areas where floodways have not been delineated. In the wide flat floodplain at the mouth of the Guadelupe River, density regulations are used to prevent obstructions to flood flows.

Recommendation: District staff should review the assumptions and conclusions of the San Jose approach for the lower Guadelupe floodplain. If it is found to be an appropriate alternative to traditional floodway regulations, it should be used to help other communities regulate other areas.

2.3. Hydrology manual. Floodplain maps and flood protection projects are based on hydrologic data. Different hydrologic assumptions and guidelines will result in different design requirements, even though the same base data are used. Currently, some cities use different approaches than the District because they have different objectives. Without consistent criteria, developers have had to prepare a design based on a city's criteria then have to do it over again to respond to District concerns.

For example, a city concerned with ensuring that a new subdivision will have storm sewers large enough to carry the 5- or 10-year storm will require the developer to use a different design method than the District, which is concerned about how the runoff from the development during the 5-, 10-, 50-, and 100-year storms will impact on downstream channels.

The District has a manual for hydrologic studies that determine the design for its projects. This manual is currently being revised. It will include an "urban hydrology" section so the cities would have study criteria that is compatible with the District's.

Recommendation: The District should carefully prepare the new hydrology manual with a maximum amount of input from the cities, other government agencies and consultants. Those who are going to have to use the manual ought to be a part of the drafting process. While they (especially the consultants for the developers) won't have a veto, they can provide some valuable input and their professional expertise should be heard. They should be willing to work toward a single approach in order to reduce their own permit review time.

2.4. Impact of the new FIRM. A preliminary draft of the new county-wide FIRM has been seen by some people. They report that in some areas the new FIRM will show a larger floodplain or a floodplain where there was none before. The residents of these areas can be expected to be very upset.

Recommendation: The District should help the cities prepare for the expected backlash that will follow the public meetings on the draft FIRM. District wide publicity and explanatory materials will help the cities who have to be the bearers of bad news. Where the larger floodplains are due to new watershed development, the District can explain the benefits of on-site detention (see issue 6.4).

2.5. Map reading service. Just as important as having the maps is making them accessible to people who need to use them. Most District and city staff have access to their own copies. The general public does not. Most cities provide a map reading service to help people determine if a property is in a floodplain. This can be a vital service to those who need the answer quickly in order to close on a mortgage. The District used to do such map determinations but now only does it for the smaller cities.

One product that makes map reading easier is a digital FIRM that can be related to street addresses. FEMA quickly developed such a FIRM for Santa Clara County after the January 1995 flood. Called an "E-FIRM," it uses software based on Census Bureau digital maps. One can enter a street address and obtain a map determination at least 75% of the time. In the rest of the cases, the addresses are too close to the floodplain boundaries for this system to call. The map reader must then turn to the paper copy and use traditional methods.

Recommendations:

a. If it doesn't already have it, the District should obtain a copy of the E-FIRM and become familiar with how it works.

b. The District should consider operating a central map reading service on behalf of the cities and the County. Such a service would make it easier for those needing the information as they would only have to call one number. The centralized service would be more efficient that 14 separate community services which will soon be using the same county-wide FIRM. CRS credit for this is provided under Activity 320. The credit criteria will change in the 1995 *CRS Coordinator's Manual* which will be out by June.

   A single map reading service could form the basis of a one-stop shop that can direct people to other District or city flood related services. It could also process requests for map amendments and revisions more efficiently. The District could charge for the service or charge for determinations made in writing to help recover some of the costs.

3. Project Planning

Once a flood problem area is mapped, the next step is to determine what can be done to reduce the flood damage. This section discusses the District's procedures for designing flood control projects. This work is generally implemented by the Flood Control Department's Flood Control Planning Division.

3.1. Local coordination. The District's Waterways Management Model is a logical process that prioritizes when an area will be looked at. It accounts for the amount of current and potential flood damage, local cost sharing, and the impact of a project on flooding elsewhere. The planning process includes a great degree of coordination with both local authorities and residents.

Recommendation: The process' priority system and local coordination procedures are both commendable. The former ensures a rational approach to addressing each area and the latter ensures a great degree of involvement by those affected. These should continue to be followed with the minor changes as recommended below.

3.2. Benefit/cost analysis. The priority system has assured that high damage areas are addressed first. The system currently assumes that all projects are cost effective. Sometime in the future, all the "good" projects will be built and the priority system will be looking at problems where the benefits of capital flood control projects may not be worth their cost.

A benefit cost analysis of each potential project can help determine the flood protection return that is obtained for the District's dollar. These analyses have often been challenged as time consuming and inadequate when evaluating benefits that are hard to measure in dollars, such as habitat improvement. FEMA has developed new benefit cost software that can minimize the time and effort devoted to the analysis.

Recommendation: The District should consider incorporating benefit/cost analyses in its planning process. The results of such analyses should not be the final arbiter of whether a project should be built. However, they can help planning staff weigh the merits of alternative solutions and they may find situations where nonstructural measures are more cost effective than the traditional channel improvements. The FEMA software could minimize the effort needed to do this.

3.3. Project timing. It takes 15-20 years from the time a project comes up on the priority system to when it goes on line. This time is needed for data collection, review of alternatives, coordination with the public, design, environmental review, permits, engineering detailed design and specifications, bidding, and construction. When people are first told that their problem is being addressed, in fact they will have to wait years before the District's project has an impact on their flood problem.

Recommendation: The District does not have to leave floodplain residents completely unprotected while a project is being planned and implemented. As noted in the next issue, the District should maximize the number of measures brought to bear on a flood problem. Many of these can be implemented in cooperation with interested residents as early as the first public meeting. While these may not provide assured protection from the 1% flood, they provide more protection than doing nothing while a project is on the drawing boards.

For example, French & Associates recently completed a floodplain management plan for the Village of South Holland, Illinois. The Village expects to have a major flood control project completed in 5-10 years. However, local flooding had convinced the Village's leaders that it should do something for its residents during the interim. The plan listed 41 recommendations for a variety of activities and the Village subsequently initiated many of them, including cost-sharing on floodproofing projects undertaken by property owners.

3.4. Alternatives considered. Figure 1 lists the possible flood protection alternatives that should be considered for each problem area. During the District's project planning, some measures are not looked at, some are discarded soon, some are mentioned but left up to others to pursue, and some are not mentioned because it is known that no one will implement them. It is not clear if the public is made aware of all the loss reduction possibilities.

For example, it is generally held that flood warning is not feasible on most streams because their small watersheds do not provide much lead time. Accordingly, the project plans do not include a warning element. However, the District's Maintenance Engineering Division makes advance preparations when weather conditions warrant and implements a flood response effort when stream gages identify flooding. If there is enough lead time to mobilize District staff, there should be enough lead time for residents and businesses to prepare themselves.

While a warning of several hours lead time may not be possible on all streams, residents could be encouraged to develop flood response plans for what lead time they have (turn off the utilities, evacuate from high hazard areas, etc.). Instructions on flood warning and response could be distributed early in the planning process, such as at the first public meeting.

Recommendations:

a. The planning process should consider all possible structural and nonstructural measures. The resulting plans should identify how each possible measure was determined to be appropriate or inappropriate.

b. District staff should become more familiar with those measures that have not been used in the area but have proven effective in other parts of the country. These include floodproofing, flood warning, flood insurance, education, and public information, all of which are recognized by the CRS. In some cases, one or more of these measures may be the only appropriate solution for a particular flood problem.

c. Those measures that can be implemented quickly, especially those implemented by property owners, should not wait several years for the project plans to be completed. The District should provide the funding, guidance materials, technical advice, etc., as needed to implement (or have others implement) those measures that do not have to wait for construction of a flood control project.

3.5. Cost sharing. In most cases, the District pays 100% of the cost of a project. In some cases, a city will contribute funds, usually to move the project higher on the priority system. Most other state and federal flood control programs share the cost with a local sponsor. The local cost share for federal programs has been increased in recent years specifically to discourage use of federal funds on minor flood problems.

Recommendations:

a. The District should continue its practice of modifying its priority schedule to respond to community funding contributions. Cost sharing is an effective tool to identify where the worst flood problems are located.

b. The District may want to consider in-kind contributions as a factor in scheduling its projects. For example, a city with tougher floodplain regulations, one with a public information program, or one willing to initiate a flood warning and response program for the problem area could be given a higher priority than the city that expects the District to do all the work.

4. Corrective measures

Figure 1 breaks floodplain management activities into two general categories: corrective and preventive measures. Using the District's approach, there are four types of corrective measures. These are reviewed in the following sections.

4.1. Streamflow reduction and containment. The statutory authority and District tradition make the District responsible for structural projects, i.e., streamflow reduction and streamflow containment measures that correct existing flooding problems by controlling floodwaters. The District's planning process ensures that the most appropriate structural flood control measure is implemented.

There is no CRS credit for new structural measures that modify flooding. This is because greater flood insurance rate reductions are provided through the FIRM revision process. The District's procedures include submitting map revisions to reflect completed projects.

Recommendation: No changes are recommended. This is an appropriate role for the District. It is a large public works agency that can handle the technical, financial and legal issues of designing and funding projects that affect more than one city. The District should continue to be the lead agency in flood control.

4.2. Channel maintenance. Keeping the channels cleared of debris and overgrowth is vital to maintaining both the natural and manmade carrying capacities of the creeks in the County. The District's program is well recognized and responsible for a large number of credit points in the CRS communities (CRS Activity 540). Some streams are not covered where the District does not have legal access.

The CRS credit criteria have changed since the 1990 applications were accepted. The CRS needs documentation that certain credit criteria have been met. This includes written procedures on how the maintenance program operates. Currently there is no standard District-wide written procedures, but there are detailed operation and maintenance manuals for selected project areas.

Recommendations:

a. The District should continue its excellent channel maintenance program and make more communities aware of the potential for CRS credit.

b. The District's Maintenance Engineering Division should prepare a District-wide standard operating procedure to enable continued CRS credit. A copy of the current guidance, *CRS Credit for Drainage System Maintenance*, has been provided. There will be minor changes with the 1995 guidance which is due out in June or July. It is important to note that the District should not weaken its program just to maximize CRS points.

4.3. Structure modification. This category of corrective measures does not try to correct the natural flow of floodwaters. Instead, it is the buildings and other facilities in the path of flooding that are "corrected" by structural modifications or clearance. Floodproofing (including moving buildings and elevating buildings on site), razing, and conversion of use can be effective corrective approaches. Floodproofing is especially cost effective in areas of shallow, slow moving floodwaters. It can also cost the District little as most floodproofing measures are implemented at the owners' expense.

The District has participated in a few elevation or single site berm projects, but they were due to unique local circumstances. It has published a small flyer "Inside: Keeping Your Home Dry in a Flood." Otherwise, the District has not participated in floodproofing or other structure modification projects.

Recommendation: The District should reconsider its approach toward floodproofing. Specifically, District staff should:

a. Review the floodproofing literature. A copy of the introductory reference, *Flood Proofing Techniques, Programs, and References*, has been provided. It lists recommended literature and federal agencies that can help local programs.

b. Review how the Community Rating System credits floodproofing technical assistance and consider providing such services (CRS Activities 330, 360, and 530).

c. Review how the Community Rating System credits acquisition and relocation of floodprone buildings and assist communities in identifying where they deserve credit (CRS Activity 520).

d. Send staff to the week-long course at the Emergency Management Institute, "Retrofitting Floodprone Residential Buildings." The course is being taught during the weeks of July 10 and September 11. Registration, travel and housing are free to city, County, and District staff. Applications are submitted through emergency management channels.

e. Review and revise the District's public information materials. The current flyer has questionable advice on how to best protect a building on a crawlspace.

f. Review other ways to assist in floodproofing buildings. A copy of a recent publication on community support for floodproofing programs, *Local Flood Proofing Programs*, has been provided.

g. Consider floodproofing and other structure modification approaches in project planning, especially for those properties to be left unprotected by a flood control project or where a structural project is not cost effective.

4.4. Emergency actions. While flood warning, response, flood fighting, and evacuation are properly the responsibility of the general purpose local governments, the District can and has played two important roles. The first is in streamflow forecasting. The District operates numerous rainfall and streamflow gages that can provide early notice of expected flooding. The data provided plus the technical interpretations that District staff can provide can be the key to an effective flood warning system.

The other activity is the Maintenance Engineering Division's flood fighting response. Division staff are posted in known problem areas when conditions are ripe for flooding. They react to channel obstructions and other problems as they are reported.

The Community Rating System provides credit for flood emergency actions under Activity 610. This credit could be available for all communities in the District by demonstrating that they are part of a cooperative, coordinated flood forecasting, warning, and response system.

Recommendation: The District should host a meeting with city and County emergency managers to review District services and flood response activities and ensure that they are consistent with and support local flood response plans. A CRS representative should be present to explain the CRS credit criteria at the same time.

4.5. Flood insurance. Property owners should consider flood insurance as a key element in their flood protection approach. Insurance can provide financial protection while they are waiting for a flood control project or if a floodproofing or other protection measure fails or is overtopped. NFIP flood insurance is available to all communities in Santa Clara County. However, large numbers of floodplain residents do not carry it. A spot check of several communities found that 1/2 - 2/3 of the floodprone residents carry insurance, well above the national average of 1/4 coverage.

Recommendation: The District should consider flood insurance as one more property protection measure and promote it as with other measures. Recent changes in the NFIP instituted by last year's National Flood Insurance Reform Act, make insurance more attractive. Several community CRS activities can assist insurance agents in explaining and selling flood insurance and should be encouraged (CRS credit: Activities 310, 320, and 330).

5. Preventive Measures

Preventive measures are just as important as corrective measures. They keep things from getting worse and creating demands for more corrective measures. As with the old adage "an ounce of prevention is worth a pound of cure," preventive measures are much less expensive than correcting new problems later.

As noted in Figure 1, there are three general categories of preventive measures: discourage people from creating flood problems, regulate their activities to prohibit those that cause problems, and acquire floodprone property to control its development and preserve floodplain habitat and open space. This section reviews the discouragement and acquisition measures and Section 6 addresses regulations.

5.1. Education and public information. One of the first steps in discouraging people from creating or aggravating flood problems is to inform them of the potential for problems and advise them on what steps to take. The District has an impressive public information operation which includes a speaker's bureau, school programs, very readable publications, and signs in public locations. Several of these techniques can qualify for CRS credit (Activity 330), although some of them focus on other District responsibilities, such as water conservation and water quality.

Recommendations:

a. District flood control staff should review the variety of floodplain management measures with the public information officer and identify messages and media that can educate and inform the public about the flood hazards and ways to protect themselves. CRS credit criteria should be considered when these materials are developed.

b. The public information officer acts as a clearinghouse as most inquiries from the public are forwarded there. The District may want to consider combining this clearinghouse work with the map reading service recommended in item 2.5.

5.2. Recordation and real estate disclosure. Often property owners complain that they were never told that they were in a floodplain and that if they knew they were, they would have purchased insurance or taken other precautionary measures. The California Division of Real Estate prepares a "Public Report" for all new subdivisions which must be made available by the developer or seller. The District provides the Division with letters that identify the subdivision's flood hazard. These are made a part of the report.

State law also requires real estate agents to advise people looking at a property whether it is in a floodplain. Normally this shows on the Multiple Listing Service summary. Both of these disclosure measures are credited by the CRS under Activity 340.

Recommendation: These disclosure programs should continue and be supported by the District. A centralized map reading service would help all involved (see item 2.5).

5.3. Assessment and financing practices. Government agencies can influence development through their fiscal policies, sometimes to discourage development, other times to have such development pay for the extra public expenses caused by floodprone development. A simple example is to charge a higher building permit fee for floodplain buildings because there is more work involved in permit review and inspection.

The District does not vary its fees or charges. While each of the five flood control zones have their own budget, properties are assessed at the same rates.

Recommendation: District staff may want to review the fees charged for its services.

5.4. Development policies. The District's policy is to encourage new developments to account for the flood hazard and to prevent or minimize any impact on local flood problems. Several excellent publications describe the policy to encourage subdivision layouts that put the creeks on public property, not hidden in back yards where they are harder to maintain.

The District does not exercise regulatory authority over development outside of its channel encroachment regulations (see item 6.2). District staff does comment on environmental impact reviews prepared for larger development proposals as required by the California Environmental Quality Act (CEQA). The District's comments are advisory only. They appear in the final report, but the city with project approval authority determines whether to require anything of the developer. The cities often view the District's requests as unreasonable. They won't implement any District recommendations that are contrary to their codes.

Recommendation: Short of attempting to exercise direct regulatory authority over new developments, the District should continue and expand its current approach of using the powers of education and persuasion to encourage developers and communities to design projects that better account for their impact on flooding. See also item 6.4.

5.5. Acquisition and open space. It is generally accepted that keeping buildings and other manmade development out of the floodplain is the best way to prevent flood damage. Through acquisition, the District can convert flood problems into open space. This can be most appropriate where there is a need for more open land to support adjoining uses. The most common examples are for recreation and parking.

A less expensive approach is to keep undeveloped areas vacant. District policies encourage keeping developments away from the channels, but, as noted in items 5.4 and 6.1-6.3, the District's regulatory powers are limited.

The CRS recognizes open space preservation under Activity 420. Some communities don't apply for all the credit they deserve because of the effort needed to measure all creditable areas. There is also a new additional credit for open space that provides a natural or beneficial floodplain function.

Recommendations:

a. District staff should develop relations with other government agencies and private organizations interested in open space preservation, such as recreational and conservation groups. Following the "multi-objective management" approach, such groups can become allies and cooperators. By pursuing their own interests, they promote good floodplain management.

b. District staff can help communities identify, measure, and document the areas appropriate for CRS open space preservation credit.

6. Regulations

These preventive activities are administered or coordinated by the Flood Control Department's Design Coordination Division.

6.1. Floodplain regulations. Each of the cities and the County regulate new development in the floodplain through zoning, building, and/or subdivision authorities. Thirteen of the 14 have Flood Insurance Rate Maps, are participating in NFIP and meet the minimum regulatory requirements as established by FEMA. Monte Sereno had its map rescinded as FEMA determined that it's flood hazard was not large enough to warrant a regulatory program.

Almost all of the 13 communities' regulations match the model ordinances published by FEMA or the state Department of Water Resources (DWR). With one or two exceptions, the communities do not exceed the minimum requirements. Those that do can receive CRS credit under Activity 430.

FEMA and DWR periodically conduct community assessment visits or CAVs. All of the recent CAV reports say that the communities are doing a good job of administering and enforcing their regulations. Problems have been found with enforcing the requirements for substantial improvements to existing buildings, a problem that is common to communities throughout the country.

Recommendation: The District should not attempt to usurp the regulatory work of the cities or the County. However, local staff may be able to use technical support that the District could provide, such as help in reviewing floodway or floodplain encroachment calculations. The District is also in a good position to initiate or support a coordinated effort to conduct training, to develop a standard procedure for determining substantial improvements, and/or to establish a mutual aid program whereby communities can help each other after a flood.

6.2. Encroachment regulations. Ordinance 83-2 authorizes the District to regulate construction and grading within a designated floodway and within 50 feet of the banks of a watercourse. Staff agree that some of the ordinance's terminology could use revision.

For example, one city challenged where the "designated floodway" is. Is it the floodways that are shown on FEMA maps or can someone else designate them? The main purpose of the regulation appears to be "securing maintenance of watercourses and prohibiting injury to District property and projects" (Section 1: Intent, Ordinance No. 83-2). It is hard to relate the maintenance of a channel to regulating a floodway construction project which is a block or two away from the channel.

While the Division has one person to pursue enforcement actions in the field, the District is heavily dependent on local building departments to advise permit applicants that they need a District permit. Most floodplain management expertise and interest is in the cities' public works or planning departments, so it is possible that some building departments may overlook Ordinance 83-2. For example, some agricultural buildings are exempt from the County's regulations, so builders in those areas may not even be aware of other permit requirements.

FEMA regulations (and therefore the community floodplain ordinances) require that a project requiring a local permit obtain all other permits required by federal or state law. Some cities say they will hold up issuing a permit in the 50' zone until they know the District has permitted the project, but others will not delay their own permits for another agency.

Recommendation: The District should review the assumptions, objectives and procedures for regulating encroachments. If the only concern is protection of those channels that are currently or likely to become the District's responsibility, then the ordinance should be amended and clarified. If the concern is protection of only those channels that the District maintains, monitoring construction in the District's easements may be more effective and efficient than relying on local building departments. If the concern is regulation of new floodplain development, then District efforts may be better spent on supporting the cities' and the County's programs (see item 6.1).

6.3. Exempt projects. The District, the cities and the County are all creatures of the state and therefore have powers limited by state law. Generally state law does not allow one government agency to regulate or restrict the activities of another agency. Local governments cannot regulate state or federal agencies. As a result, projects such as light rail train stations and highway sound barrier walls can be built in floodplains without obtaining a local permit.

However, many such projects must still comply with CEQA and projects which are federally-funded must comply with Executive Order 11988. EO 11988, Floodplain Management, requires the funding agency to avoid supporting floodplain development. Projects that must be located in a floodplain must follow an evaluation process to minimize the impact on flooding. FEMA is charged with monitoring agency compliance, although each agency makes its own final determinations. Unfortunately, FEMA's Region 9, which covers California, does not have the staff to monitor agency compliance with the Executive Order.

Recommendation: The District should ensure that all appropriate projects are reviewed in accordance with CEQA and EO 11988. One staff person should be designated as liaison to FEMA to make sure all projects are brought to FEMA's attention and to facilitate coordination and response to District concerns. Because there is no formal system to register complaints or concerns, that person should contact Bill Lesser at FEMA Headquarters (202/646-2807) to discuss procedures.

6.4. Stormwater regulations. The traditional practice in the Santa Clara Valley has been to get stormwater off a site and send it to the San Francisco Bay as fast as possible. Because most of the creeks drain directly to the Bay, this technique can work. However, as more of the watershed is urbanized, the same amount of rain produces more runoff. Channels become overloaded more often and flood before they can convey all the runoff to the Bay.

As a result, the District has had to invest money in improving channels that may well become obsolete in the future. The demand for larger and larger channels has been driven primarily by the increases in impervious surfaces and improved drainage systems that come with urbanization of the watersheds.

The more common practice elsewhere in the nation is to make developers pay for the increased burden their projects put on the public infrastructure, either by financing the increased costs of downstream channel improvements or by mitigating the impact. Most find it cheaper and more effective to retain their excess runoff on their properties in detention basins. Instead of being rushed to the creeks, the excess runoff is held on site and let out slowly over time when the creeks can handle the smaller loads.

The cities of Santa Clara County may or may not require on-site or regional detention. Most CEQA reviews by the District recommend it, but sometimes the cities balk at adding extra expenses to the developer. Sometimes it will mean an extra expense to the city which may assume an obligation to maintain the detention basins. There is also a sense on the part of some that detention does not work or can be counter productive when downstream basins release their water when the creeks are full.

The District does not have the statutory authority to require developers to incorporate stormwater detention. It is dependent on convincing the communities with that authority that it is in the public interest. However, if local staff interpret the District as responsible for accepting whatever is sent to its channels, there is no incentive for the cities to require detention.

Another problem that can arise is when the cities focus on conveying smaller storms in pipes and allowing the runoff from larger storms to flow on the surface. While this is standard practice almost everywhere, only the piped flow is directed to the channels. The District may construct a levee to protect an area from overbank flooding and the levee may act as a dam to the surface runoff during heavy rains.

A lack of a coordinated policy on regulating stormwater runoff can result in aggravating local flood problems and add to the long term costs of flood protection. It does not make sense for one public agency to ignore the long term costs to its own taxpayers by passing on problems to another agency that represents the same constituency. The taxpayers of the Valley should not have to continually pay in order to have drainage facilities keep up with problems created by new developments.

Recommendations:

a. The District should work with the cities and the County to develop a joint stormwater management program. This may have to begin with an educational program that confirms the benefits of detention or develops parameters that all agree determine where detention is most effective. The objective of this work would be a cooperative regulatory effort voluntarily entered into by the District and the cities. The District should provide the technical expertise for project review to support the cities' regulatory programs. A substantial number of CRS credit points are available for a watershed-wide regulatory program (CRS Activity 450).

b. Should a voluntary program not work for some communities, the District should consider some incentives to obtain their cooperation. For example, the District should consider local stormwater management regulations as a cost share requirement for a District flood control project as discussed in issue 3.5.

   A good example of this approach is the Metropolitan Water Reclamation District of Greater Chicago which collects and treats the sewage from approximately 100 Cook County communities. When the Reclamation District's sanitary sewers became overloaded with excess infiltration and inflow in the early 1970's, it required all contributing communities to enact stormwater management measures. If they did not, the District refused to allow any more sewer hook ups. As a result, all of the communities have been requiring detention since the 1970's.

7. Communication and Coordination

Good communication does not mean that everyone agrees or has to agree with each other, but it does prevent or minimize misunderstandings and suspicions between agencies. Early on, the District established a mechanism to communicate and coordinate its programs with local officials and the public: the flood zone advisory committees. These were seen by all as a very productive and useful approach and they should be continued.

7.1. Staff communication. All of the staff interviewed reported good relations between the District and the cities. However, most of the contacts are with the planning and engineering staff, not the building department staff who issue the permits for projects that may affect the District's encroachment regulations.

One barrier to communication is agency roles, i.e., people feel they have to defend their agency's position, regardless of their personal beliefs. There is a "neutral ground" where agencies, positions, and roles are not important: professional organizations, such as the American Society of Civil Engineers and the Floodplain Management Association.

Recommendations:

a. The District should go out of its way to involve local staff, especially early in the development of new activities. This includes more that just the traditional project planning, but activities such as draft FIRM review, preparation of the hydrology manual, and development of a new public information program.

b. A special effort should be made to meet with local building department staffs. They should be involved from the beginning in the District's review of its encroachment regulations program (see issue 6.2).

c. The District should encourage and support staff participation in the state's Floodplain Management Association and the national Association of State Floodplain Managers. The District should host association workshops or dinner sessions to review problems of design, programs, legislation, etc., that are common to all public agencies in the Bay area. A copy of the national association's annual conference brochure is being provided. The 1996 national conference will be in San Diego which should make it accessible to several staff members.

7.2. NFIP coordination. The National Flood Insurance Program can be a very complicated program. It has mapping, regulatory, insurance, building design, mitigation, and public information aspects that are interrelated and mutually supportive. Most local officials do not work with it enough to become familiar with all of its details and requirements. On the other hand, a flood control agency with a regulatory program spends much more time on these issues than most local officials.

Recommendation: The District should identify a staff person as its NFIP coordinator. That person would have the following duties:

-- Introduce him/herself to FEMA and the Department of Water Resources and get on their mailing lists.

-- Follow the program's requirements and developments and advise District and community staff on them.

-- Attend CAVs and other NFIP activities, including a Bay area NFIP workshop to be held by the Department of Water Resources in the next few months. Contact: Ruth Dudley at 916/327-1590.

-- Attend the Emergency Management Institute's floodplain management course which will be held during the week of June 9. An alternate, but less effective, approach is to take the soon to be released home study course.

-- Contact the city and County offices responsible for NFIP administration and advise them of his/her services.

7.3. CRS coordination. The Community Rating System has many benefits, including guidance on organizing a floodplain management program, national recognition of local efforts, and an incentive to maintain and improve a variety of floodplain management activities. As with the NFIP, the CRS can be a complicated and confusing program. Most local officials do not work with it enough to become familiar with all of its details while a larger flood control agency can spend the time needed to follow and understand the program.

Recommendation: The District should designate a person as the CRS liaison. That person would have the following duties:

-- Talk to the ISO/CRS Specialist for Northern California, Rob Flaner, and ask for suggestions on appropriate activities. Rob is eager to help get more Santa Clara County communities in the CRS (510/798-8237).

-- Read up on the CRS and the *CRS Coordinator's Manual.* A copy of the CRS Summary is being provided. The *Coordinator's Manual* and other materials can be ordered by calling 317/848-2898.

-- Attend the reverification and technical assistance visits to Milpitas, Los Altos, and San Jose to be held during the week of April 10. Contact Rob Flaner on the details.

-- Attend the CRS course at the Emergency Management Institute to be held during the weeks of August 7, September 25, or October 23.

-- Contact Ron Nevitt, CRS Coordinator for the Maricopa County Flood Control District in Phoenix and ask for his recommendations on how he helps the communities in his district (602/506-1501).

-- Develop and publicize a list of activities where the District can provide assistance in applying for or implementing them.

7.4. Post flood coordination. The days and weeks following a flood offer a unique opportunity for flood damage reduction. There are four reasons why this timing can be so productive:

a. A flood will bring federal, state, and regional people from various agencies and fields together to focus their attention on the area and its flood problems.

b. The residents and elected officials will be more interested and more willing to spend time on flood problems and to try some new solutions.

c. If the damage was severe enough, it may be relatively easy to clear out a destroyed area and preserve it as open space.

d. If the damage was severe enough to warrant a major disaster declaration, there will be several different sources of money to buy or rebuild properties so that they will be protected from flood damage.

Recommendation: While there are city and County emergency management plans that guide local activities after all types of disaster, the District should develop a post-disaster recovery plan that focuses on flood loss reduction and preparing for the next flood. The plan would guide District and community activities to minimize confusion and disruption and maximize the opportunities for flood damage reduction. The plan should include the following components:

-- Damage assessments,
-- Restoring public services,
-- Recovery responsibilities and assignments,
-- Regulatory requirements and enforcement of the substantial damage rule,
-- Identifying mitigation opportunities,
-- Public information, and
-- Financial assistance.

One common theme from flooded communities has been that they wish they were better prepared for their post-disaster responsibilities. Developing a plan with maximum input from community staff can help do this. The planning process brings people together and forces them to play through various scenarios before the flood. The same people will be working together after a disaster and will better understand their responsibilities and will be more comfortable with working with each other.

Conclusion

The Santa Clara Valley Water District has done an excellent job in designing and implementing structural flood control, stream maintenance, public information, and other flood loss reduction programs. However, it has the authority and ability to implement a variety of other floodplain management activities, some of which can be more appropriate for some situations and some of which can be implemented faster and at less cost to the District. Where it lacks statutory authority, the District can provide technical support to the city and county agencies that do.

The District should develop a strategy to improve and diversify the activities that are brought to bear on local flood problems. The pieces of the strategy should be based on the individual recommendations of this report. Most of them can be accomplished without major expenditure by reorienting the directions of some staff. For example, many things can be accomplished through technical assistance and support to local staffs and property owners.

The strategy should be developed with a maximum amount of input from the planning, engineering, and code enforcement staffs of the cities and the County. Where technical discussions fail to persuade the communities, the District has some incentives, particularly through project planning and scheduling, to encourage them to support good floodplain management.

Appendix A: People Interviewed

The following people were interviewed either in person or on the telephone in the course of this project. Addresses and telephone numbers can be obtained from French & Associates.

Santa Clara Valley Water District

Stan Williams, General Manager

Flood Control Department

P. Kay Whitlock, Manager
Nai Hsueh, Supervising Engineer, Flood Control Design Division
Randy Talley, Supervising Engineer, Flood Control Planning Division
Marc Klemencic, Supervising Engineer, Design Coordination Division
Sue Tippets, Design Coordination Division
Abdullah Saah, Senior Civil Engineer, Hydrology Section
Bill Hoeft, Flood Control Budget Officer

Maintenance Department

Jose Ortiz, Supervising Engineer, Maintenance Engineering Division

Theodora "Teddy" Morse, Public Information Officer

City of San Jose

Jim Tanner, Associate Civil Engineer, Dept of Public Works, Development Services Division

City of Morgan Hill

Steve Machida, Senior Engineer, Dept of Public Works
Simon Sue, Assistant Engineer, Dept of Public Works

City of Milpitas

Steve Erickson, Civil Engineer and CRS Coordinator
Cecil Williams, Emergency Manager

California Department of Water Resources, Sacramento

Andrew Lee, Chief, Floodplain Management Branch
Ruth Dudley, Chief, Flood Loss Reduction Section

Federal Emergency Management Agency

Robert Durrin, Natural Hazards Program Specialist, Region 9, San Francisco
Bill Lesser, Program Specialist, Mitigation Directorate, Washington, DC

Other

Robert Flaner, ISO/CRS Specialist, Pleasant Hill, CA
Jim Owen, Executive Secretary, the Floodplain Management Association, Palo Alto
Peggy Kershell, Division of Real Estate, Sacramento

Appendix B: Community Rating System Activities

The *CRS Coordinator's Manual* describes the 18 floodplain management activities credited by the Community Rating System (CRS) and the documentation required to receive credit for each activity. The credits and formulae used to calculate credit are also included. These activities are divided into four categories or series. The activities' credit points can be increased if they are part of a comprehensive floodplain management plan (Section 240).

Public Information (Series 300)

This series credits programs that advise people about the flood hazard, flood insurance, and ways to reduce flood damage. These activities also provide data needed by insurance agents for accurate flood insurance rating.

310 (Elevation Certificates) Maintain FEMA elevation certificates for new construction in the floodplain. Keeping certificates after the date of CRS application is a minimum requirement for any CRS credit.

320 (Map Determinations) Respond to inquiries to determine what FIRM zone a property is in and publicize this service.

330 (Outreach Projects) Send information about the flood hazard, flood insurance, and flood protection measures to floodprone residents or all residents of the community.

340 (Hazard Disclosure) Real estate agents advise potential purchasers of floodprone property about the flood hazard; or regulations require a notice of the flood hazard.

350 (Flood Protection Library) The public library maintains references on flood insurance and flood protection.

360 (Flood Protection Assistance) Give inquiring property owners technical advice on how to protect their buildings from flooding and publicize this service.

Mapping and Regulations (Series 400)

This series credits programs that provide increased protection to new development. These activities include mapping areas not shown on the Flood Insurance Rate Map (FIRM), preserving open space, enforcing higher regulatory standards, and managing stormwater. The credit points for the activities in this series are increased for growing communities.

410 (Additional Flood Data) Develop new flood elevations, floodway delineations, wave heights, or other regulatory flood hazard data for an area that was not mapped in detail by the flood insurance study; or have the flood insurance study's hydrology or allowable floodway surcharge based on a higher state or local standard.

420 (Open Space Preservation) Guarantee that currently vacant floodplain will be kept free from development; additional credit for areas still in, or restored to, their natural state.

430 (Higher Regulatory Standards) Require freeboard; require soil tests or engineered foundations; require compensatory storage; zone the floodplain for minimum lot sizes of one acre or larger; or have regulations tailored to protect critical facilities or areas subject to special flood hazards (e.g., alluvial fans, mudslides, or subsidence).

440 (Flood Data Maintenance) Keep flood and property data on computer records; use better base maps; or maintain elevation reference marks.

450 (Stormwater Management) Regulate new development throughout the watershed to ensure that post-development runoff is no worse than pre-development runoff.

Flood Damage Reduction (Series 500)

This series credits programs for areas in which existing development is at risk. Credit is provided for addressing repetitive loss problems, relocating or retrofitting floodprone structures, and maintaining drainage systems. There is no CRS credit for new structural measures that modify flooding. This is because greater flood insurance rate reductions are provided through the FIRM revision process.

510 (Repetitive Loss Projects) This is a minimum requirement for all repetitive loss communities (i.e., those with two or more flood insurance claim payments since 1978 on the same property for more than $1,000 each).

520 (Acquisition and Relocation) Acquire and/or relocate floodprone buildings so that they are out of the floodplain.

530 (Retrofitting) Document floodproofed or elevated pre-FIRM buildings.

540 (Drainage System Maintenance) Conduct periodic inspections of all channels and retention basins and remove debris as needed.

Flood Preparedness (Series 600)

610 (Flood Warning Program) Provide early flood warnings to the public and have a detailed flood response plan keyed to flood crest predictions.

620 (Levee Safety) Maintain levees that are not credited with providing base flood protection.

630 (Dam Safety) All communities in a state with an approved dam safety program receive credit (California's is approved).

Publications on the CRS are available at no cost from:

Flood Publications (317) 848-2898
NFIP/CRS
P.O. Box 501016
Indianapolis, IN 46250-1016